From:	Katherine Mishkin
To:	Denise Zeno
Cc:	Rebecca Ofrane; Michael Moltzen; Mel Hauptman
Subject:	Cabo Rojo - SOW hydro comments
Date:	04/08/2012 07:36 PM

Hi Denise,

I have reviewed the statement of work for Cabo Rojo and just have a few comments, below, which are mainly requesting clarification on a few items as well as some recommendations to incorporate contingent methods depending on how site activities progress. Please let me know if you have any questions.

General comments:

1) During the January RI/FS scoping meeting, there was some discussion on how the river is a source to the aquifer; however, with the exception on page 2-6, there is no mention of this in the SOW and studies that could potentially focus on groundwater/surface water interactions. Groundwater/surface water interaction studies may not be necessary depending on the concentrations of contaminants detected in groundwater and surface water; however, it is recommended that they are included as a contingent study similar to the optional matrix diffusion and cross-borehole analyses as the CSM is refined.

2) The SOW includes a recommendation for a cross-borehole test as a contingent study prior to final FLUTe installation. Although the utility of this test is dependent on several factors, such as fracture characteristics, a major limiting factor is the distance between the proposed monitoring well locations. The closest situated wells are about 2000 ft from one another, which decreases the likelihood of observing a water level response while pumping from an isolated packer zone in another well. If cross-borehole testing becomes a selected method at a later date, it may be necessary to install a more proximal observation well. Additionally, the option of incorporating a tracer to delineate groundwater migration pathways through fractures should also be considered, especially since this was discussed during the January scoping session, specifically with using oxygen (18/16) isotopes. Since cross-borehole testing is a contingency component of the work plan, additional items such as an additional observation borehole as well as incorporating a tracer study should also be included as contingenies.

3) Although this may will be conducted and not specifically included in the statement of work, it is unclear if temporary flexible liners will be placed in the open boreholes between geophysical logging and wireline sampling activities, and prior to final FLUTe installation. It is recommended that temporary liners are utilized to prevent contaminant movement within the borehole.

Specific comments:

1) Page 1-6, Section 1.4 Current Conditions - the current operations of particular pumping wells appear to be unknown. For example, it is unknown whether the Club de Leones well is currently in operation, little information is known with regard to the El Coqui Pump Station, and it is unknown whether Cabo Rojo 1 well is in operation. Certain wells were inaccessible during previous site visits, such as the Hacienda Margarita and the Remanzo wells. It is unclear whether a component of the work plan involves further investigation into the well operating procedures. Geophysical logging/well evaluations will be conducted at four of the public supply wells, so it is assumed that a more intensive investigation will be carried forward in terms of obtaining a better understanding for operating procedures; however, this should be clarified in the work plan. Additionally, the text reflects

uncertainty in well conditions, while the tables, for example Table 1-2, provide more certainty. This is misleading. The pumping conditions of these wells is a major consideration in terms of the overall conceptual site model, especially since the groundwater flow is strongly influenced by pumping at the wellfield, most notably in the vicinity of Club de Leones, so it is important that this information is better understood.

2) Page 3-21: Continuous Water Level Monitoring: It states that pressure transducers will be deployed in up to 10 existing boreholes to monitor aquifer response. It is unclear which 10 boreholes could be selected, when at most only 9 wells have been identified within the vicinity of the site. If there are additional existing wells in the area, it would be helpful to have these locations provided in a figure.

3) Figure 1-1: Public supply wells, WEKO 1 and 2, are not shown on Figure 1-1. Based on their relative location in Figure 2-1, it appears as though they should be in the area near Delicias on figure 1-1. Please amend in future submissions.

4) Figure 2-3 shows a cone of depression caused by pumping at the Club de Leones well. However, as discussed above, it is shown that pumping conditions of the Club de Leones are unknown, therefore indicating that this figure may represent an inaccurate depiction. Please provide recent information about current pumping conditions of the Club de Leones, as well as all water supply wells, and provide an accurate representation of present-day conditions in figure 2-3 once they are better understood.

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